much harm because it was so easy for accoucheurs to use the vectis without their patient's knowledge. Denman had neither cephalotribe nor craniotomy forceps; after perforation his only resource was to pull with the crotchet, fixing this in different places, and pulling till something came, thus getting the head away in bits if it would not come through entire. As to Cæsarean section, if this seemed called for, the question before Denman was not whether Cæsarean section or some other mode of delivery should be chosen, but whether Cæsarean section should be performed at all; whether it was not kinder to the patient, and better, to let her die undelivered, than to perform a painful and almost certainly fatal operation.

Puerperal Diseases.

The pathology of eclampsia was in 1805 shrouded in darkness. Its connection with albuminuria was unknown, and it is doubtful whether Denman had a clear idea of the differences between an epileptiform fit and other convulsive seizures.

Finally, the last chapters of Denman's book bring us to realise the most stupendous advance that has ever been made in medicine: the discovery that disease is produced by micro-organisms, and the power of antiseptics to protect human beings from such disease. Puerperal fever was to Denman a fatal disease, presenting clinically various forms (which he made no attempt to differentiate), the cause of which was utterly unknown. It is now certain that this disease can be prevented; although it is unfortunately also true that many women are still attended in labour by persons who either do not know or do not use the methods by which it can be prevented. Since Denman's time anæsthetics have relieved labour of its pain, and by making artificial delivery easier and more frequent have robbed childbirth of some of its danger.

Cæsarean Section.

But the consequences of Lord Lister's discoveries reach far further and are not yet exhausted. The once almost certainly fatal Cæsarean section is the simplest of all abdominal operations. When the surgeon opens the abdomen to remove a diseased part, he can never before exactly tell in what way the disease may have displaced or otherwise altered the parts he will have to deal with; and therefore he may in any such operation meet with some unexpected and formidable difficulty. In spite of this, the percentage of deaths following such operations is very small. No such difficulty attends Cæsarean section. In this operation the operator has to deal only with structures that are healthy and in their natural relations. The terrible mortality of the operation in the past came from septic poisoning, from bleeding, because operators knew not how to sew up the uterus; from the operation being done on patients who were exhausted and their tissues damaged by protracted labour; and from its being done in a hurry, under unfavourable circumstances, and by inexperienced operators. All these causes are preventable, and there seems no insuperable reason why the mortality of Cæsarean section should not be brought down to that of natural delivery. The dream of obstetricians for years has been the abolition of craniotomy. Denman helped to prevent the destruction of the child in a large class of cases by teaching the induction of premature labour. Within the last quarter of a century it has seemed as if the revival of symphysiotomy would render premature labour unnecessary. There is now good ground for believing that in the near future a perfected method of Cæsarean section may relegate craniotomy, the induction of premature labour, and symphysiotomy alike to the past.

Surgery in 1800.

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The teaching of surgery at the beginning of the century is well represented by Samuel Cooper's *Dictionary of Practical Surgery*, an excellent piece of work, comprehending all methods of treatment of surgical cases, and all special surgery, and much physiology and pathology; and enlivened by many little personal touches of humour and of vehemence that are kept out of the textbooks of the present day. Having strength and soundness of constitution, it enjoyed a long life. It was still the best textbook of surgery, more than twenty years after it first appeared. In 1834, when the late Sir James Paget began his apprenticeship, he was told by a friend in the profession that he must possess the *Dictionary*:—

"For your *first year's Library*, let me recommend the last Edition of Cooper's *Surgical Dictionary*, an admirable Book, containing everything, the price about one guinea; you may keep it at home, and refer to it whenever you meet with a *hard* word."

Let us take in order some of the more important articles in the *Dictionary*, and see what were the principles and the practice of surgery about a hundred years ago.

Abdomen.

Cooper follows John Bell's teaching, that the entry of air into the abdominal cavity is not in itself dangerous to life. In any case of protrusion of wounded intestine through a wound of the abdominal wall, he would suture the intestine and return it; he might even, in quite recent cases of wounded intestine without protrusion, dilate the wound of the abdominal wall, "to see whether the part is near enough to be got at." But "when the wounded bowel lies within the cavity of the abdomen, no surgeon of the present day would have the rashness to think of attempting to expose the injured intestine for the purpose of sewing up the breach of continuity in it." He is inclined to operate, in favourable cases, for the cure of fæcal fistula. He would not operate on any case of gunshot wound, or on any wound of the gall bladder. And he does not say a word about operation for internal strangulation, or for any sort or kind of internal obstruction.

Achilles Tendon.

Nothing is said of any operation to unite a ruptured tendo Achillis, and nothing is said of tenotomy.

Amaurosis.

This article, 17 pages long, is a good example of the confusion and vagueness of ophthalmic surgery before Helmholtz invented the ophthalmoscope; we understand the old joke, "Amaurosis is a disease in which the patient is blind, and the surgeon can't see anything." Cooper makes no clear distinction between cases of optic neuritis and cases of disturbed vision from remote causes. He defines amaurosis as a "paralytic affection of the retina and optic nerve;" but he seems to pass without a break from the transient hemianopia of migraine to the worst cases of optic atrophy.

Amputation.

Writing before anæsthetics, he is terribly concerned for the want of more dexterity in these operations:

"The reason of the knife being so badly handled in th part of surgery, may generally be imputed to carelessness, slovenly habits, and fear and confusion on the part of the

operator. There are several egregious faults in the method of amputating, which even many hospital surgeons in this metropolis are guilty of."

Especially, he says, men are clumsy in dividing the bone:—

"In no part of the operation of amputation do operators in general display more awkwardness than in sawing the bone. It is one of the most common remarks of such persons as are in the habit of frequently seeing amputations, that the part of these operations, which a plain carpenter would do well, foils the skill of a consummate surgeon, and few operators acquit themselves well in using the saw."

He emphasises the need of using a linen retractor to the cut muscles, to avoid the "unnecessary, unjustifiable torture" of wounding them with the saw. Of ligatures he says that they are "commonly made of inkle, waxed together with white wax."

Amputation of the Heads of Bones.

Under this curious title he describes the first cases of excision, done by Park, Jeffray, and the two Moreaux, father and son. These earliest excisions were, of course, at a fright, ful disadvantage. He says of them in the *Dictionary* what he had said of them seven years before in a prize essay:—

"The grounds on which I shall at present withhold my approbation from the attempt to cut out large joints, are the following: (1) The great length of time (many months) which the healing of the wound requires. (2) Even supposing the excision of the knee to be followed with all possible success, is the advantage of having a mutilated, shortened, stiff limb, in lieu of a wooden leg, sufficiently great to induce any man to submit to an operation, beyond a doubt infinitely more dangerous than amputation? I think not."

Antrum Maxillare.

For abscess of the antrum he recommends perforation through, or just above, the alveolar edge. For malignant disease, he describes at great length one case of partial resection by Desault; but would prefer in a similar case only to open the antrum freely and scrape out the disease.

Bronchocele.

"The most famous mode of curing the bronchocele," he says, "is by giving internally burnt sponge, and occasionally a calomel purge, at the same time employing frictions to the tumour itself." He advises that the burnt sponge should be given in lozenges containing 10 grs. each of burnt sponge burnt cork, and pumice stone. It would be of interest, in the present day, to work out the active principles of this lozenge. With regard to operation, he condemns it. Of two operations recorded by Mr. Gooch, one had been abandoned half-way; the other had been followed by secondary hæmorrhage, it had been impossible to tie the vessels, and the patient's life had been saved by digital compression kept up without intermission for a week. Still, he would not absolutely forbid the attempt to save life, either by removal of the gland, or by tying the arteries, in certain rare cases of bronchocele with dangerous obstruction.

"Bronchotomy."

Tracheotomy, which is called bronchotomy, is very carefully described. He commends the operation in cases of a foreign body in the air passages, and in certain forms of laryngeal disease with obstruction. He is not very hopeful of it in cases of "membranous croup;" and he condemns the horrible proposal that it should be performed in cases of extreme chronic enlargement of the tonsils. Artificial respiration, as now practised, was not known to him; and he approves of bronchotomy, with inflation of the lungs, in cases of apparent death from drowning. "It may be executed with a penknife, if no better instrument be at hand; and when the incision has been made, a pair of common bellows will suffice for the inflation of the lungs."

Cancer.

This wise long-sighted article on cancer is one of the best in the *Dictionary:* not for its pathology, which is almost *nil*, and the microscope is not once spoken of, but for its sound practical teaching. He disfavours all caustics, and urges the early removal of the disease. "The operation is always permissible when every particle of the disease can be removed by it. Even large open cancers, if they can be entirely cut away, are often capable of being effectually cured." He is, of course, hampered by the inevitable difficulties of his time; but, within its set limits, his teaching here is excellent.

Cataract.

The prodigious length of the article on cataract, 33 pages long, is in sharp contrast with his indifference to the surgery of the ear and of the throat. The chief diseases of the eye have each their separate place in his system; the diseases of the ear are all dismissed in one article of 9 pages. It was long before Wilde in Dublin, Toynbee in London, Politzer in Vienna; there was no Eustachian catheter, save a futile sort of irrigator passed through the nose, no Politzer's bag, no "Wilde's incision," no sort or kind of mastoid operation; indeed, he does not so much as mention the mastoid. The old reproach held true, that the diseases of the ear were divided into those that could be cured by syringing and those that could not be cured by anything.

"Cirsocele."

In treating of cirsocele (varicocele), no word is said of any operation; only, "other writers have related cases of cirsocele, in which the pain was so intolerable and incurable that nothing but castration could afford the patient any relief." It does not appear from the article that the existence of a varicocele was any bar to naval or military service.

Electricity.

It is hard to realise the amazing uses and abuses of electricity before Duchenne's time. Shocks and sparks were administered on general principles; and had been "tried" in cases of tuberculous synovitis, syphilis, and tetanus. There was no faradic current, no diagnostic use of electricity; men found enough encouragement in Mr. Abernethy's cryptic statement that "electricity has a tendency to promote whatever action or process happens to be going on in a diseased part at the time of its application."

"The electrical fluid, as a topical remedy, has been chiefly confined to the following diseases—namely, superficial inflammation, ophthalmia, gutta serena, deafness, scrofulous enlargements, anomalous tumours, fistula lachrymalis, ulcers, cutaneous eruptions, cancers, and abscesses."

Empyema.

Nothing is said of auscultation or percussion; it was three years before the invention of the stethoscope; but it was five years after Corvisart's translation into French of Avenbrügger's *Inventum Novum ex Percussione Thoracis Humani.* Without these physical signs, the diagnosis and the treatment of empyema stood about where Hippocrates had left them; and the *Dictionary* is melancholy reading here, telling of patients who died, and "were opened," and their chests found full of pus. The operation, as in the time of Hippocrates, was incision, and, in some cases, drainage; no bone was removed.

Fractures.

This article, more than fifty pages long, is full of profitable teaching, and gives a very good account of all special frac

tures. For the whole treatment of compound fractures it quotes Perceval Pott at great length. For the treatment of ununited fracture, where all else has failed, it describes the operation, first performed by Charles White, of Manchester, on January 3rd, 1760, "to cut down to the ends of the bone, rasp or saw them off, and then treat the limb just as if the case were a recent compound fracture." It quotes, with some approval, four or five cases of this kind; but says that the operation had frequently failed, and had sometimes proved fatal. And, it adds, "a modern proposal has lately been suggested—namely, to pass a seton through the new joint." The operation invented by White was, of course, without any wiring or pegging of the ends of the fragments.

GONORRHŒA.

Cooper dares not decide as to the unity or duality of the venereal poison. "The reader must weigh the different arguments himself." He quotes Hunter, Swediaur, and others to support the doctrine of unity, and Benjamin Bell for the duality; but, for himself, he "waives all attempts to decide the point." Only, he goes so far with the dualists, that he would not for gonorrhœa exhibit mercury, nor do most of the best practitioners:—

"If venereal symptoms do ever follow gonorrhœa, they are so excessively rare, and, I may add, always so imputable to other causes, that the employment of mercury as a prevention would, upon the whole, do more injury than benefit to mankind; and this, even admitting (what, in my mind, has never been unequivocally proved) that the matter of gonorrhœa is really capable in a very few instances of giving rise to the venereal disease."

HÆMORRHOIDS.

He would not operate for hæmorrhoids, save in very severe cases, after all palliative treatment had failed. He prefers the knife to the ligature, and is opposed to the use of caustics or the cautery. And he condemns the common opinion that hæmorrhoids are of a salutary or critical nature.

HERNIA.

In the article on hernia, which extends to fifty pages, many authorities are quoted, and at great length: Scarpa, Pott, Lawrence, Hey, Astley Cooper, and many more. In the account of the ordinary operation for strangulated hernia it is taken as a matter of course that the sac shall be laid open freely: only, in a strangulated hernia of enormous size, old, adherent, never properly reduced, the stricture should be divided, "but without laying open the hernial sac, or attempting to reduce the parts. The reasons against the common plan are the difficulty of separating all the old adhesions; the hazardous inflammation which would be excited by laying open so vast a tumour; and the probability that parts so long protruded might even bring on serious complaints if reduced." Lawrence's advice against attempting to divide the stricture without opening the sac is approved; so is his advice, if the intestine be gangrenous, not to attempt to unite it over a bobbin, nor to moor it in the wound, but only to dilate the stricture, and to leave the adherent knuckle of intestine to slough. With regard to the "radical cure," it should not be attempted on an irreducible hernia; Cooper quotes Pott's vigorous words:

"I am not unapprised what influence a successful operation or two of this sort has had on the unknowing; but I also know that such accidental successes have emboldened the same operators to commit more than one or two murders in similar cases; and that, from the prevalence of fashion, some of these rupture-doctors have been largely rewarded, when they ought to have been hanged."

But for a suitable case of reducible hernia Cooper would not wholly condemn the "royal stitch," that is, the simple ligature of the sac through a two-inch incision. And he adds, "After performing the common operation for the relief of a strangulated bubonocele, might not this opportunity be taken to learn whether a radical cure would not more frequently be accomplished than is at present the case?" He also gives at prodigious length the arguments for and against a rough and ready radical cure of umbilical hernia in children, by the ligature of sac and skin together.

HYDROCELE.

Six methods of radical treatment for hydrocele are enumerated: incision, excision, caustic, tent, seton, and injection. He commends the last, according to Sir James Earle's method—two-thirds of wine to one-third of water.

INTUSSUSCEPTION.

In the article on intussusception, "called also volvulus," he reviews and finds useless all methods of medical treatment, and condemns operation.

"If the equivocal and uncertain nature of the symptoms of volvulus were not enough to deter us from undertaking an operation, which under the most favourable circumstances could not fail to be extremely difficult, and imminently hazardous to the patient, the state of the invaginated parts will entirely banish all thoughts of such an imprudent attempt."

JOINTS.

In an excellent article on the joints, full of practical wisdom, he sets aside a vast number of remedies for tuberculous joints; and chiefly praises rest, and counter-irritation with blisters and issues. He says nothing of the value of extension with a weight; but his other rules of treatment are excellent.

LUMBAR ABSCESS.

As to lumbar abscess (psoas abscess) he teaches that when it must not be left alone it should be treated by Abernethy's method of repeated puncture:

"His method is, to let out the matter, and heal the wound immediately afterwards by the first intention. He justly condemns all introductions of probes and other instruments, which only irritate the edges of the puncture, and render them unlikely to grow together again. The wound is to be carefully closed with sticking plaster, and it will almost always heal."

It is a pity that Abernethy recommended also "other means to promote dispersion of the abscess; blisters kept open with savine cerate, issues, electricity, occasional vomits of zincum vitriolatum."

MAMMA.

The successive stages of the operation for removal of the mamma are described very carefully; for, says Cooper, "I could not find, in any surgical book with which I am acquainted, what I conceived to be a proper description of the mode of removing a diseased breast." He insists on the supreme importance of early operation in cancer; the nipple must be removed in all cases, and the skin over the tumour; and the incisions must be carried down "at a prudent distance from the swelling, so as to be sure to remove with the diseased mass every atom of morbid mischief in the vicinity." Enlarged glands are to be removed through a separate incision.

MORTIFICATION.

This article of seventeen pages is based for the most part on Larrey's magnificent *Mémoires de Chirurgie Militaire;* and upholds his rule, that "when gangrene is the result of a mechanical cause, and puts the patient's life in danger, amputation ought to be performed, without waiting until the disorder has ceased to spread." The date of Larrey's first operation of this kind is 1796.

NEPHROTOMY.

"The operation of cutting a stone out of the kidney" is, he states, "a proceeding which, perhaps, has never been actually put into practice." "There is no doubt," he adds, "that stones have often been extracted from abscesses about the region of the kidneys, after their presence has been detected with a probe. But with regard to cutting into the kidney, the deep situation of this viscus, and the want of symptoms by which the lodgment of a stone in it can be certainly discovered, will always be strong objections to the practice."

ŒSOPHAGOTOMY.

It is somewhat surprising to find that this operation was performed, and with success, so long ago as 1738, and again some years later (Goursand, Rolland). Cooper approves of it if a patient were dying of obstruction by a foreign body: "Doubtless the uncertain chance of the operation should be preferred to the certainty of a fatal result." There is no mention of any sort of gastrostomy.

OVARIAN DROPSY.

The whole subject of the surgical diseases of the female organs and their treatment takes but a few pages; and these are of no particular value. No word is said of ovariotomy. (The date of McDowell's first operation is 1809.) Uterine polypi, and the chief displacements of the uterus, and their treatment, are noted; but there is nothing, or next to nothing, about the inflammations of the pelvic organs.

RECTUM, CANCER OF.

For the treatment of "the scirrho-contracted rectum," there is the use of bougies, and the administration of palliative treatment. (The date of Amussat's first colotomy is 1839.)

SPINA BIFIDA.

Cooper describes very carefully Benjamin Bell's proposal to ligature the tumour—"I do not know whether this gentleman ever put the above scheme in practice; but suppose not"—and two cases, one of them successful, treated by Abernethy and Astley Cooper by repeated puncture and pressure. He makes no mention of any method of injection.

TESTICLE, DISEASES OF.

This article is mainly taken from Perceval Pott. But in truth it is impossible, at this present time, to understand his account of these diseases; the term "sarcocele" was applied by him to diseases that have long since been defined and set apart.

TONGUE, DISEASES OF.

No mention is made of tuberculous or syphilitic ulceration of the tongue; but something is said of the latter in the article on Venereal Disease. It is probable that in the tongue and in the testicle tertiary syphilis was seldom recognised. "Very malignant" ulcers of the tongue, Cooper says, are sometimes cured by medical treatment. For "true cancerous disease," he advises free removal by the knife, and not caustics. "Cruel as the operation of removing the tongue may appear, we should not hesitate to perform it whenever the disease has made a certain progress and is decidedly of a cancerous nature."

There is no need, and no space left, to contrast the surgical teaching of 1800 with that of 1900. But it may well be doubted whether any of our present surgical textbooks far excel this old *Dictionary of Practical Surgery* in common sense, carefulness, and safe doctrine put in plain words. We have come into vast legacies of facts, and take as a matter of course things that Cooper never had; but that does not prove that we make better use of our opportunities, or have more love of our work, than the men of a hundred years ago.

Sanitary Knowledge in 1800.

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In order to understand the condition of things from a public-health point of view at the end of last century and the beginning of this, it is necessary to consider briefly the important discoveries with regard to the prevention of disease made during the eighteenth century.

SMALL-POX.

It was near the beginning of that century that inoculation for small-pox was introduced into this country by Lady Mary Wortley Montague, the wife of the English Ambassador to Turkey, this practice having arrived in Constantinople, it is supposed from Circassia, before the end of the seventeenth century. The advantages and disadvantages of inoculation have been so frequently discussed that it is unnecessary to enlarge on the subject here. That the practice itself became almost universal is a sufficient proof of the general prevalence of small-pox, and also (to quote from a lecture I delivered in Birmingham in 1874)

"Shows us at once, in the most striking manner, the fearful nature of the disease. Here was one of the most loathsome diseases, and certainly the most terrible and fatal disorder to which mankind has ever been subject, and yet people deliberately took the poison of this fearful disease and inoculated their children and themselves with it, and this was done in the last century amongst all ranks up to the Royal Family. Why was this? Every inoculated person became a focus for the spread of the disease, and yet inoculation was to a great extent successful, not in preventing the spread of the disease, but in diminishing the number of deaths from it. What does that mean? There is only one thing that it can mean. If they increased the number of centres from which the disease could spread, and actually did spread, in the most virulent form, and in spite of that the death-rate was lessened, which it was considerably, there is only one conclusion to which we can come, which is that the whole population was so infected by the disease that the multiplication of the centres of infection was a matter of little importance compared with the advantage obtained by getting the disease in the milder form in which it usually appeared after inoculation. Inoculation did spread the disease, because during the periods when inoculation was practised epidemics were more frequent than they were before or have been since; but for all that the death-rate was less. For instance, before inoculation was practised, there were 71 or 72 epidemics every 100 years. During the 63 years when inoculation was practised, there were no fewer than 53 epidemics, which is equivalent to 84 every 100 years. This practice is now illegal, and very wisely so."

LEAD POISONING.

Next came the discovery by Sir George Baker that the "Devonshire colic" was produced by lead poisoning. This disease was very prevalent in that county at the beginning of the century, and was generally attributed to the drinking of cider. Various theories, which we need not trouble ourselves with, were started by different observers to account for such a disease being produced by cider. Sir George Baker, however, recognised the symptoms as those of lead poisoning. He had samples of Devonshire cider analysed and found lead in them, whereas samples of cider from Here-